

CLAIMS

1. Reverse osmosis sea water desalination system; of the type that comprises: a reverse osmosis membrane with  
5 a pressurised water inlet, an osmotised water outlet and a rejected water outlet, a boost pump and a feed device with at least one hydraulic cylinder for distributing the pressurised water supplied by the pump and using the pressure of the water rejected by the osmosis membrane;  
10 **characterised** in that the feed device (2) comprises:  
- a first hydraulic cylinder (7) consisting of: two jacketed cylinders (71, 72) which face one another and are fastened to an intermediate distribution body (73) that is made of a plastic material and has two separate  
15 chambers (74, 75) for the pressurised water from the pump (1) and rejected water from the osmosis membrane (3) to flow through respectively and two pistons (76, 77) housed in the respective cylinders (71, 72), which are connected by a common rod (78) that passes through  
20 the intermediate body (73),  
- a second hydraulic cylinder (8) consisting of: two jacketed cylinders (81, 82) that face one another and are fastened to an intermediate distribution body (83) that is made of a plastic material and has two separate  
25 chambers (84, 85) for the pressurised water from the pump (1) and rejected water from the osmosis membrane (3) to flow through respectively and two pistons (86, 87) housed in the respective cylinders (81, 82), which are connected by a common rod (88) that passes through  
30 the intermediate body (83),  
- a central interconnection body (9) that is made of a plastic material and fastened to the intermediate distribution bodies (73, 83) of the hydraulic cylinders (7, 8), said central interconnection body (9) having: a  
35 hole (94) for the inlet of rejected water from the

membrane (3), a hole (92) for the outlet of rejected water that leaves the system, a hole (91) for the inlet of pressurised water from the pump (1), a hole (93) for the outlet of pressurised water towards the osmosis  
5 membrane (3), and a plurality of internal pipes that enter the chambers (74, 75, 84, 85) of the intermediate bodies (73, 83) and enter pipes (12) that communicate with the front cavities (7a, 7b, 8a, 8b) and with the rear cavities (7c, 7d, 8c, 8c) defined by the pistons  
10 (76, 77, 86, 87) inside the respective jacketed cylinders (71, 72, 81, 82) of the hydraulic cylinders (7, 8) and,

- a number of sliding pieces (10) (11) housed in the chambers (74, 75) (84, 85) of the intermediate bodies  
15 (73) (83) that can move between two end positions in which they establish different interconnections between the internal pipes in the central body (9) and a number of pipes (12) that enter the chambers (74, 75) (84, 85) of the intermediate bodies.

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2. System, according to claim 1, **characterised** in that the rods (78, 88) of the hydraulic cylinders (7, 8) have intermediate thicker sections (79, 89) for the selective movement of the sliding pieces (10, 11) of a certain  
25 cylinder (7) (8) when the pistons (76, 77) (86, 87) of said cylinder approach the end of their stroke.

3. System, according to claim 1, **characterised** in that the sliding pieces (10, 11) have a surface (13) that is  
30 in permanent contact with one of the surfaces of the central body (9), which the internal pipes enter.

4. System, according to claim 3, **characterised** in that the sliding pieces (10, 11) have a central rebate on the  
35 contact surface (13) for the interconnection, through

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this, of at least two of the internal pipes of the central body (9).

5        5. System, according to claim 4, **characterised** in that the sliding pieces (10, 11) have a clip (15) on their rear end to mount them so that they may slide on the rods (78, 88) of the corresponding hydraulic cylinder.

10       6. System, according to claim 5, **characterised** in that the sliding pieces (10, 11) have a rear rebate (16) to house a spring (17) that is positioned between said sliding piece (10, 11) and the rod (78, 88) of the corresponding hydraulic cylinder (7, 8), the spring pressing the contact surface (13) of said sliding piece  
15       (10, 11) against the central interconnection body (9).

20       7. System, according to claim 7, **characterised** in that the spring (17) is covered by a protective sheath (18) made of a plastic material.

25       8. System, according to claim 1, **characterised** in that the rods (78, 88) of the hydraulic cylinders (7, 8) alternately describe strokes in opposite directions, alternating the propulsion of pressurised water towards the osmosis membrane (3) and using the rejected water from the membrane (4) to collaborate with the pressure provided by the pump (1) in order to move the hydraulic cylinder (7, 8).

30       9. System, according to claim 1, **characterised** in that the alternate functioning of the hydraulic cylinders (7, 8) provides a continuous flow of pressurised water towards the entry to the osmosis membrane (3).

35       10. System, according to claim 1, **characterised** in that the pipes (12) are defined in the concentric chambers

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between the jackets of the cylinders (71, 72, 81, 82)  
and in the walls of the intermediate bodies (73, 83).

There follow 5 sheets of drawings numbered  
5 correlatively.